

USDA
NATURAL RESOURCES
CONSERVATION SERVICE
MARYLAND
CONSERVATION PRACTICE
STANDARD

CONSERVATION CROP
ROTATION

CODE 328
(Reported in Acres)

DEFINITION

Growing crops in a recurring sequence on the same field.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following resource concerns:

1. To reduce sheet and rill erosion.
2. To maintain or improve soil organic matter content.
3. To manage the balance of plant nutrients.
4. To manage plant pests (weeds, insects, and diseases).
5. To provide food for domestic livestock.
6. To provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land where crops are grown, except for the following:

1. This standard does not apply to pastureland, permanent hayland, or other land uses where annual row crops or close growing crops are grown occasionally, only to facilitate renovation or re-

establishment of perennial vegetation.

2. It does not apply to land devoted to orchards, vineyards, or nurseries.

CONSIDERATIONS

When used in conjunction with strip cropping practices (Stripcropping – Contour, Code 585, or Stripcropping – Field, Code 586), the cropping system shall include crops and tillage methods to achieve the desired alternating cover management conditions consistent with the strip cropping design.

When used in combination with conservation practices for Residue Management (Codes 329A, 329B, 329C, and 344), the selection of high residue producing crops and varieties, use of cover crops, and decreased row spacing can enhance residue production (type, amount, and distribution) and erosion protection.

Erosion from sprinkler irrigation may be reduced by crops or cover crops that develop surface canopy rapidly and/or produce an adequate amount of residue.

Where maintaining or improving soil organic matter content is an objective, the effects of this practice can be enhanced by increasing/retaining crop residues and reducing tillage. In addition, animal wastes and/or mulch may be applied to supplement the biomass produced by crops in the rotation.

Where excess plant nutrients or soil contaminants are a concern, utilizing deep rooted crops and/or cover crops in the rotation can help remove nutrients or contaminants from the soil profile.

Where precipitation is limited, seasonal, or erratic, moisture can be conserved for crop use by maintaining crop residues on the soil surface to increase infiltration and to reduce runoff and evaporation. Where winter precipitation occurs as snow, additional moisture can be obtained for crop use by trapping snow with standing residue.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service

Soil compaction can be reduced by including deep rooted crops that are able to extend to and penetrate the compacted soil layers. Crops that require field operations when the soils are wet should be avoided.

Where pesticides are used, care should be taken to avoid carryover effects on future crops.

Leaving rows of unharvested crop standing at intervals across the field or around the edges of the field can enhance wildlife habitat value by providing protective cover and/or food over winter. Crop residues may be a valuable food source for wintering wildlife where winter browse is sparse.

This practice has the potential to have either a positive or negative effect on National Register listed or eligible (significant) cultural resources (archeological, historic, or traditional cultural properties). Care should be taken to avoid adverse impacts to these resources.

CRITERIA

General Criteria Applicable To All Purposes

Crops shall be grown in a planned, recurring sequence as specified in the conservation plan.

Crops shall be adapted to the climatic region, the soil resource, and the goals of the producer. Adapted crops and varieties, listed in appropriate university publications or other approved sources, shall be selected.

A conservation crop rotation may include crops planted for cover or nutrient management.

Crops shall be selected that produce enough above and below ground plant biomass to control erosion within the soil loss tolerance (T) or any other planned soil loss objective.

The Revised Universal Soil Loss Equation (RUSLE) erosion prediction technology will be used to evaluate the effectiveness of the cropping sequence to reduce erosion to acceptable levels. Calculations shall account for the effects of all conservation practices, in-

cluding management and supporting practices, in the conservation management system.

Additional Criteria To Maintain Or Improve Soil Organic Matter Content

Crops shall be selected that produce the amount of plant biomass needed to maintain or improve soil organic matter content, as determined using the current approved Soil Conditioning Index Procedure.

Erosion shall not exceed the soil loss tolerance (T).

If partial removal of residue by means such as baling or grazing occurs, adequate residue shall be maintained to achieve the desired level of soil organic matter.

Cover and green manure crops planted specifically for soil improvement may be harvested or grazed, providing adequate biomass is retained to achieve the desired level of soil organic matter.

Additional Criteria To Manage The Balance Of Plant Nutrients

Crop selection, sequence, and management shall achieve the desired nutrient balance. This determination shall be based on current University of Maryland procedures and guidelines.

To reduce excess nutrients, crops or cover crops having rooting depths and nutrient requirements that utilize the excess nutrients shall be included in the crop sequence.

When crop rotations are designed to add nitrogen to the system, nitrogen-fixing crops, including cover crops, shall be grown immediately prior to or interplanted with nitrogen depleting crops.

Additional Criteria To Manage Plant Pests (Weeds, Insects, Diseases)

Crops shall be alternated to break the pest cycle and/or allow for the use of a variety of control methods consistent with Integrated Pest Management principles. Affected crops and alternate host crops shall be removed

from the rotation for the period of time needed to break the life cycle of the targeted pest.

Resistant varieties, listed in appropriate university publications or other approved sources, shall be selected where there is a history of a pest problem.

Noxious weeds shall be controlled as required by Maryland State law.

Additional Criteria To Provide Food For Domestic Livestock

Crops shall be selected to balance the feed supply with livestock needs. The needed amount of selected crops shall be determined using an appropriate livestock forage/feed balance procedure.

Additional Criteria To Provide Food and Cover For Wildlife

Crop selection to provide either food or cover for the targeted wildlife species shall be determined using an appropriate wildlife habitat evaluation procedure.

SPECIFICATIONS

Specifications for this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications should include the cropping sequence, the numbers of years of each crop, and the total length of the crop rotation. Specifications shall be recorded using narrative statements in the conservation plan, job sheets, or other acceptable documentation.

OPERATION AND MAINTENANCE

Producers may need to modify crop rotations due to crop failure, specific weather events, or economic conditions. Crop rotations should provide for acceptable substitute crops. Acceptable substitute crops are crops having similar properties that meet the criteria for all of the resource concerns identified for the field or treatment unit.

Proper adjustment, operation, and maintenance of equipment are essential for successful implementation of this practice.

SUPPORTING DATA AND DOCUMENTATION

1. Identify resource concern(s) to be treated (see **PURPOSES**).
2. Ensure that field location, acreage, and crop rotation needed to address the identified resource concern(s) are recorded in the conservation plan.
3. Provide appropriate documentation for identified concerns (e.g. - soil loss calculations, soil conditioning index calculations, nutrient management plan, livestock feed balance calculations, and/ or wildlife habitat evaluation) if needed.

REFERENCES

1. Agricultural Handbook 703, USDA Agricultural Research Service, Washington, D.C., 1996.
2. Maryland RUSLE Manual (FOTG), USDA NRCS, Current Version.
3. National Handbook of Conservation Practices, USDA Natural Resource Conservation Service.
4. Conservation Research Report No. 41, Crop Residue Management To Reduce Erosion and Improve Soil Quality - Appalachia and Northeast, USDA Agricultural Research Service, Washington, D.C., August, 1995.
5. Stubble Over the Soil. The Vital Role of Plant Residue in Soil Management to Improve Soil Quality, Carlos Crovetto Lamarca, 1996.
6. COMAR – Title 9 Subtitle 4 Maryland Weed Control Law.
7. Soil Quality Agronomy Technical Note No. 2, USDA NRCS, August, 1996.
8. Maryland Nutrient Management Manual, Maryland Dept. of Agriculture, Current Version.